

## LASTILAC AR-VOE

Acrylonitrile-Butadiene-Styrene copolymer (ABS) based compound.

UL94 V-0 classified, with brominated flame retardants, PBB/PBDE free. Very high dimensional stability. Very good surface appearance.

PHYSICAL PROPERTIES	STANDARD	VALUE MEASURE UNITS
Density	ISO 1183	1.20 g/cm <sup>3</sup>
Linear shrinkage at moulding		
Longitudinal (2.0mm/60MPa)	ISO 294-4	0.40 ÷ 0.60 %
Transversal (2.0mm/60MPa)	ISO 294-4	0.45 ÷ 0.65 %
Dimensional stability	---	79
Moisture absorption (in air)		
after 24hrs	ISO 62-4	0.04 %
MECHANICAL PROPERTIES	STANDARD	VALUE MEASURE UNITS
CHARPY impact strength		
Unnotched, at +23°C	ISO 179-1eU	50.0 kJ/m <sup>2</sup>
Unnotched, at -20°C	ISO 179-1eU	35.0 kJ/m <sup>2</sup>
Notched, at +23°C	ISO 179-1eA	7.0 kJ/m <sup>2</sup>
Notched, at -20°C	ISO 179-1eA	4.0 kJ/m <sup>2</sup>
Tensile elongation		
At yield (5 mm/min), 23°C	ISO 527 (1)	2.0 %
At yield (5 mm/min), 60°C	ISO 527 (1)	2.3 %
At yield (5 mm/min), 90°C	ISO 527 (1)	2.3 %
At break (5 mm/min), 23°C	ISO 527 (1)	8.0 %
At break (5 mm/min), 60°C	ISO 527 (1)	50.0 %
At break (5 mm/min), 90°C	ISO 527 (1)	95.0 %
Tensile strength		
At yield (5 mm/min), 23°C	ISO 527 (1)	40 MPa
At yield (5 mm/min), 60°C	ISO 527 (1)	30 MPa
At yield (5 mm/min), 90°C	ISO 527 (1)	20 MPa
At break (5 mm/min), 23°C	ISO 527 (1)	35 MPa
At break (5 mm/min), 60°C	ISO 527 (1)	20 MPa
At break (5 mm/min), 90°C	ISO 527 (1)	5 MPa
Elastic modulus		
Tensile (speed 1 mm/min), at 23°C	ISO 527 (1)	2300 MPa
Tensile (speed 1 mm/min), at 60°C	ISO 527 (1)	1900 MPa
Tensile (speed 1 mm/min), at 90°C	ISO 527 (1)	1500 MPa

## LASTILAC AR-VOE

Acrylonitrile-Butadiene-Styrene copolymer (ABS) based compound.

UL94 V-0 classified, with brominated flame retardants, PBB/PBDE free. Very high dimensional stability. Very good surface appearance.

THERMAL PROPERTIES	STANDARD	VALUE MEASURE UNITS
<b>Coefficient of linear thermal expansion (CLTE)</b>		
+30°C to +100°C (longitudinal)	ISO 11359-2	35 µm/(m·°C)
<b>VICAT - Softening point</b>		
49 N (heating rate 50°C/h)	ISO 306	95 °C
<b>HDT - Heat Deflection Temperature</b>		
0.45 MN/m <sup>2</sup>	ISO 75	85 °C
1.81 MN/m <sup>2</sup>	ISO 75	80 °C
<b>C.U.T. - Continuous Use Temperature</b>		
Long period (20,000h)	---	70 °C
FLAMMABILITY	STANDARD	VALUE MEASURE UNITS
<b>Oxygen Index</b>		
	ASTM D 2863	28 %
<b>Flammability rating</b>		
3.00 mm thickness	UL 94	V-0
1.50 mm thickness	UL 94	V-0
0.75 mm thickness	UL 94	V-2
<b>GWFI - Glow Wire Flammability Index</b>		
	IEC 60695-2-12	960°C/1mm
	IEC 60695-2-12	960°C/2mm
<b>GWIT - Glow Wire Ignition Test</b>		
	IEC 60695-2-13	850°C/1mm
	IEC 60695-2-13	725°C/2mm
ELECTRICAL PROPERTIES	STANDARD	VALUE MEASURE UNITS
<b>CTI - Comparative Tracking Index</b>		
solution A (without surfactant)	IEC 60112	350 V

## LASTILAC AR-VOE

Acrylonitrile-Butadiene-Styrene copolymer (ABS) based compound.

UL94 V-0 classified, with brominated flame retardants, PBB/PBDE free. Very high dimensional stability. Very good surface appearance.

### MATERIAL - STORAGE

Sealed, undamaged packages has to be kept in dry storage facilities, providing they are also able to protect them from weather and accidental damage.

### HANDLING AND SAFETY

Detailed information about a safe treatment of the material are indicated in the "Material Safety Data Sheet" (MSDS) furnished with the first material supply. The MSDS may be also sent again in case of loss.

### PREDRYING CONDITIONS

At least 3 hours at 70 ÷ 80°C

These are the suggested conditions to reduce the moisture content to adequate levels. Temperature and drying time can be reduced by using vacuum ovens. Particularly wet material may need a longer drying time.

### ACTUAL MELT TEMPERATURE

180 ÷ 210°C

The injection moulding machine settings needed to obtain the suggested melt temperature will depend greatly on shot size and machine capacity, as well as other moulding parameters such as: injection speed, screw RPM, back pressure, etc. Typical barrel temperature profile would be: 190°C (nozzle) - 190°C - 190°C - 190°C. On small machines, running short cycles, it is possible to use higher melt temperatures (up to 220°C) to improve plastification, fluidity and surface appearance, paying attention to any indication of material degradation.

### MOULD TEMPERATURE

40 ÷ 60°C

The mould temperature suggested above is the actual tool steel temperature. This can be significantly different from the tool settings, due to the cooling system efficiency and the accuracy of the temperature control on the tool.

### INJECTION SPEED

Medium

The advisable injection speed greatly depends on cavity geometry and injection moulding machine size. The use of high injection speed can improve the surface appearance, but it can also cause outgassing and burn marks due to overheating through shear stress. Typical medium values are between 35 and 55 mm/s.

### SCREW RPM (Screw diameter: 25 mm)

80 ÷ 120 rpm (max)

The specific screw speed is highly dependent on the injection moulding machine size and type. Typical suggested values are 100 ÷ 110 rpm for small screw diameter. The higher the diameter, the lower the value must be.

### INJECTION PRESSURE

Medium

The injection pressure depends on the material grade, the part and the moulding conditions. The typical range of the maximum values is 80 ÷ 140 bar (hydraulic pressure).

### PACKING PRESSURE

35 ÷ 60% of injection pressure

The packing pressure has to ensure a good packing of the material, in order to reduce shrinkage and sink marks, but not prevent the ejection of the part.

### BACK PRESSURE

Medium

The actual backpressure values depend on many different factors and can differ from the machine settings. High backpressures can cause high shear stress affecting the material properties due to degradation. LATI suggests applying the lowest backpressure needed to keep a constant cushion and avoid the presence of air in the material.

### REGRIND USAGE

The use of regrind is possible, but should be assessed on the basis of the project, moulding parameters, and type of grinding used. The effect of using regrind on material properties must be evaluated by the customer on its specific project and process. High percentages of regrind (>10%) may cause a reduction in viscosity, reducing mechanical properties, first resilience. Usually, 10 ÷ 15 % of regrind doesn't affect significantly the material properties, provided that it is properly dried (in-loop regrind is suggested). According to UL guideline, up to 25% of regrind is permitted, without affecting the ratings of the yellow card. However, LATI suggests that no more of 15% of regrind is used.

### HOT RUNNER MOULDS

Hot runner moulds are not recommended. Injection moulding machines with a shot size 1 ÷ 2 times the cavity volume are suggested.

## LASTILAC AR-VOE

Acrylonitrile-Butadiene-Styrene copolymer (ABS) based compound.

UL94 V-0 classified, with brominated flame retardants, PBB/PBDE free. Very high dimensional stability. Very good surface appearance.

### TO AVOID

In order to prevent any material degradation, over-dimensioned machines should be avoided.

### EQUIPMENT WEAR/CORROSION

Usually, critical processing conditions (high injection rate, high back pressure and high screw rotating speed, etc.) and/or disadvantageous geometric conditions (low wall thickness, low diameters, sharp fillet radius, etc.) generate wear on equipment. Wear increases in case of filled materials (particularly fibre filled ones). Appropriate equipment surface treatments are suggested in these cases, as well as a proper venting to avoid material overheating. Compound containing flame retardant additives are, in general, more aggressive than standard versions. Therefore, steels with a high chrome percentage and/or with a specific surface treatment (e.g. Chrome or Nickel electroplating) are suggested.

### APPROVALS

USA (UL): Product versions approved according UL recommendations are available.  
Please, check our site or contact LATI for details.

### NOTES

**The products mentioned herein are not suitable for applications in contact with foodstuff or for potable water transportation, or for toy manufacturing. The products mentioned herein are not suitable for applications in the pharmaceutical, medical or dental sector.**

### CONTACTS

**LATI Industria Termoplastici S.p.A.**